AMENDMENT OF THE CLAIMS

Please cancel Claims 1-24 without prejudice or disclaimer, and add new claims 25-40 as follows:

Claim 24 (new): A method of reducing speckle-pattern noise at the image detection array of a planar laser illumination and imaging (PLIIM) based system, said method comprising the steps of:

(a) producing a planar laser illumination laser beam (PLIB) within a planar laser illumination and imaging (PLIIM) based system including an image detection array having image forming optics with a field of view (FOV) arranged in a coplanar relationship with said PLIB;

(b) reducing the spatial-coherence of said PLIB before said PLIB illuminates a target object, so that the object is illuminated with a spatially coherent-reduced planar laser illumination beam (PLIB) and numerous substantially different time-varying speckle-noise patterns are produced at said image detection array over the photo-integration time period thereof;

(c) detecting said numerous substantially different time-varying speckle-noise patterns over said photo-integration time period; and

(d) temporally averaging said detected speckle-noise patterns at said image detection array during said photo-integration time period thereof, thereby reducing the power of observable speckle-noise patterns at said image detection array.

Claim 25 (new): The method of claim 24, wherein step (b) involves applying a spatial phase shifting technique during the transmission of said PLIB toward the target.

Claim 26 (new): The method of claim 25, wherein the spatial phase shifting technique practiced during step (b) comprises:

shifting the spatial phase of the transmitted PLIB along the planar extent thereof so as to modulate the phase along the wavefront of the PLIB and produce said numerous substantially different time-varying speckle-noise patterns at the image detection array during the photo-integration time period thereof.

Claim 27 (new): The method of claim 25, wherein the spatial phase shifting technique practiced during step (b) is selected from the group consisting of: moving the relative position/motion of a cylindrical lens array and a laser diode array in said PLIIM based system; reciprocating a pair of rectilinear cylindrical lens arrays relative to each other; transmitting said PLIB through an acousto-optical Bragg-type cell enabling steering of said transmitted PLIB using ultrasonic waves; and reflecting said PLIB off an ultrasonically-driven deformable mirror structure.

Claim 28 (new): The method of claim 25, wherein step (b) comprises micro-oscillating a pair of refractive cylindrical lens arrays relative to each other in order to spatial phase shift said PLIB prior to target object illumination.

Claim 29 (new): The method of claim 25, wherein step (b) comprises micro-oscillating a pair of light diffractive cylindrical lens arrays relative to each other in order to spatial phase shift said PLIB prior to target object illumination.

Claim 30 (new): The method of claim 25, wherein step (b) comprises micro-oscillating a pair of reflective elements relative to a stationary refractive cylindrical lens array in order to spatial phase shift said PLIB prior to target object illumination.

Claim 31 (new): The method of claim 25, wherein step (b) comprises micro-oscillating said PLIB using an acoustic-optic modulator in order to spatial phase modulate said PLIB prior to target object illumination.

Claim 32 (new): The method of claim 25, wherein step (b) comprises micro-oscillating said PLIB using a piezo-electric driven deformable mirror structure in order to spatial phase modulate said PLIB prior to target object illumination.

Claim 33 (new): A planar laser illumination and imaging (PLIIM) based system for producing digital images with reduced levels of speckle-pattern noise, said PLIIM based system comprising:

a planar laser illumination array (PLIA) including a plurality of laser diodes for producing and projecting a planar laser illumination beam (PLIB) through a light transmission aperture, so as to illuminate an object as it is moving past said PLIIM based system;

an image formation and detection (IFD) module having ~~a~~ an image detection array and imaging forming optics for providing said image detection array with a field of view (FOV),

wherein said PLIB and said FOV are arranged in a coplanar relationship along the working range of said PLIIM based system so that the PLIB illuminates primarily within said FOV of the IFD module; and

a speckle-pattern noise reduction subsystem, integrated with said PLIA, for reducing the spatial-coherence of said PLIB before said PLIB illuminates a target object so that the object is illuminated with a spatially coherent-reduced planar laser illumination beam (PLIB) and numerous substantially different time-varying speckle-noise patterns are produced at said image detection array over the photo-integration time period thereof;

whereby said numerous substantially different time-varying speckle-noise patterns are detected at said image detection array over said photo-integration time period, and said detected speckle-noise patterns are temporally averaged at said image detection array during said photo-integration time period thereof,

thereby reducing the power of observable speckle-noise patterns at said image detection array.

Claim 34 (new): The PLIIM based system of claim 33, wherein said speckle-pattern noise reduction subsystem applies a spatial phase shifting technique during the transmission of said PLIB towards the target.

Claim 35 (new): The PLIIM based system of claim 34, wherein the spatial phase shifting technique comprises modulating the spatial phase of the transmitted PLIB along the planar extent thereof so as to modulate the phase along the wavefront of said PLIB and produce said numerous substantially different time-varying speckle-noise patterns at the image detection array during the photo-integration time period thereof.

Claim 36 (new): The method of claim 34, wherein said speckle-pattern noise reduction subsystem is selected from the group consisting of: means for moving the relative position/motion of a cylindrical lens array and a laser diode array in said PLIIM based system; means for transmitting said PLIB through an acousto-optical Bragg-type cell enabling steering of said transmitted PLIB using ultrasonic waves; and means for reflecting said PLIB off an ultrasonically-driven deformable mirror structure.

Claim 37 (new): The PLIIM based system of claim 34, wherein said speckle-pattern noise reduction subsystem comprises means for micro-oscillating a pair of refractive cylindrical lens arrays relative to each other in order to spatial phase modulate said PLIB prior to target object illumination.

Claim 38 (new): The PLIIM based system of claim 34, wherein said speckle-pattern noise reduction subsystem comprises means for micro-oscillating a pair of light diffractive cylindrical lens arrays relative to each other in order to spatial phase shift said PLIB prior to target object illumination.

Claim 39 (new): The PLIIM based system of claim 34, wherein said speckle-pattern noise reduction subsystem comprises means for micro-oscillating a pair of reflective elements relative to a stationary refractive cylindrical lens array in order to spatial phase shift said PLIB prior to target object illumination.

Claim 40 (new): The PLIIM based system of claim 34 wherein said speckle-pattern noise reduction subsystem comprises means for micro-oscillating the planar laser illumination beam (PLIB) using an acoustic-optic modulator in order to spatial phase shift the PLIB prior to target object illumination.

Claim 41 (new): The PLIIM based system of claim 34, wherein said speckle-pattern noise reduction subsystem comprises means for micro-oscillating the planar laser illumination beam (PLIB) using a piezo-electric driven deformable mirror structure in order to spatial phase shift said PLIB prior to target object illumination.